

STANDARD SPECIFICATIONS  
& CONSTRUCTION DETAILS MANUAL

## SECTION 7 - SANITARY SEWERS

### 7.01 Design

#### a. General Requirements:

Sanitary sewer extensions shall comply with the design guidelines set forth by the City of Raleigh Public Utilities Department Handbook as well as the minimum design criteria set forth by the Division of Water Quality of the NC Department of Environment & Natural Resources.

#### b. Location:

All public sanitary sewer mains shall be within dedicated street rights-of-way or dedicated sanitary sewer easements. When sanitary sewer mains are installed in street rights-of-way, they shall be located in the center of the pavement or right-of-way, where practical, or the south or west side of the pavement.

In natural drainageways, sewers shall be extended to all upstream property lines to readily enable future connection to adjoining property (Per Section 19.2.5 of the *Unified Development Ordinance*).

On dead end sewers, the sewer main shall extend to a point where the terminal manhole is contiguous to the lot being served. In streets, the terminal manhole shall be inside the lot line extended, so as to be within the street frontage of the lot being served.

Minimum widths of permanent sanitary sewer easements shall be in compliance with the City of Raleigh. Sanitary sewer easements shall not overlap with drainage easements. No permanent building structures of any kind are allowed within the sewer easement.

Sanitary sewers shall not be installed under any part of an existing impoundment or beneath any area to be impounded. Where a sanitary sewer and a storm sewer cross, and the vertical separation is less than 12 inches with the sanitary below the storm or the sanitary is above the storm, the sanitary sewer shall be ductile iron pipe.

Pipe material, service lateral material, manholes, manhole accessories shall conform to City of Raleigh requirements.

### 7.02 Trench Excavation & Preparation

#### a. General Requirements:

The pipeline trench shall be excavated to the line and gradient shown on the approved drawings. The length of trench which may be open ahead of pipe laying operations shall be no more than 100 feet and no less than 20 feet unless warranted by special circumstances, and then only upon approval of the Town Representative.

The trench bank shall be vertical from the bottom to a point not less than one foot above the top of the pipe. The Contractor shall do all bracing, sheeting, sloping of bank, shoring, pumping, etc., as required to prevent caving of the banks, all in strict accordance with applicable O.S.H.A. regulations.

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**b. Dewatering:**

The ground adjacent to the excavation shall be graded to prevent surface water from entering the trench. The Contractor will, at his expense, remove by pumping or other means approved by the Town Representative, any water accumulated in the trench and shall keep the trench dewatered until bedding and pipe laying are complete. When water is pumped from the trench, the discharge shall follow natural drainage channels. Proper erosion control measures shall be employed for prevention of siltation.

**c. Rock Excavation:**

Where rock is encountered, the trench shall be excavated in strict accordance with applicable O.S.H.A. regulations.

**d. Blasting Procedures:**

Blasting for trench rock may be initiated only after the permitting requirements prescribed in Section 2.04 of these Specifications have been complied with. The Contractor is also reminded of the work hour limitations for blasting, as also established in Section 2.04.

Blasting Procedures shall conform to all applicable local, state, and Federal laws and ordinances. The Contractor shall take all necessary precautions to protect life and property, including the use of an approved blasting mat where there exists the danger of throwing rock or overburden. The Contractor shall keep explosive materials which are needed on the job site in specially constructed boxes provided with locks. These boxes shall be painted red and plainly identified as to their contents. After working hours, the boxes containing explosive material shall be removed from the job site.

Failure to comply with this specification shall be grounds for suspension of blasting operations until full compliance is made. No blasting shall be allowed unless a galvanometer is employed to check cap circuits. Where blasting takes place within 500 feet of a utility, structure, or property which could be damaged by vibration, concussion, or falling rock, the Contractor shall be required to keep a blasting log containing the following information for each and every shot:

1. Date of shot
2. Time of shot
3. Foreman's name
4. Number and depth of holes
5. Approximate depth of overburden
6. Amount and type of explosive used in each hole
7. Type of caps used (instant or delay)
8. The weather

This blasting log shall be made available to the Town Representative upon request and shall be kept in an orderly manner. Compliance by the Contractor with these specifications does in no way relieve him of legal liabilities relative to blasting operations.

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The Town Representative reserves the right to require removal of rock by means other than blasting where any utility, residence, structure, etc. is either too close to, or so situated with respect to the blasting hazardous.

### **7.03 Unloading and Storage of Pipe Materials**

The unloading and loading of all pipe, fittings, and other accessories shall be in accordance with the manufacturer's recommended practices and shall at all times be performed with care to avoid any damage to the material.

Once on the job site, all materials shall be stored in accordance with the manufacturer's recommended practices, and within the limits of the Project site.

### **7.04 Pipe Laying**

All gravity sewer lines and manholes shall be laid to the line and grade shown on the approved drawings with no deviations whatsoever unless approved by the Town Representative.

The pipe interior shall be kept clean throughout the pipe laying operation. Pipe ends shall be plugged at the end of each work day. Plugs shall be watertight to prevent the entrance of foreign matter into the pipe.

### **7.05 Backfilling**

#### **a. General:**

Backfilling shall be completed as soon as possible, so as to minimize the length of time that the trench or any part thereof is left open.

### **7.06 Installation of Steel Casing Pipes by Boring & Jacking**

Steel casing pipe to be installed by simultaneous boring and jacking shall be constructed to meet required standards of the NCDOT. For railroad crossings, the construction requirements shall conform to the requirements of the affected railway company.

The project drawings shall show a plan and profile for each casing pipe to be installed. The plan shall clearly note the casing pipe wall thickness and length. For railroad crossings, the Contractor shall be certain that a proper license agreement has been obtained and that any special insurance requirements are complied with.

### **7.07 Cutting & Replacement of Existing Pavements**

Open-cut of existing bituminous pavement is generally not permitted on Town streets, designated State maintained roads, and on private driveways. Where bituminous pavements are approved for open-cut, the pavement shall be restored with pavement replacement conforming to the detail shown on the approved drawings.

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Open-cut of concrete pavement may also be permitted where required at existing private driveways. Concrete pavement shall be restored with pavement replacement conforming to the standard detail and to the complete satisfaction of the affected property owner.

The pavement shall be cut to true neat lines, with cutting equipment as may be approved by the Town Representative, and in such a manner as not to damage the pavement outside the cutting line. The cut pavement shall then be broken up as necessary and then hauled away before trench excavation is begun to prevent its being mixed with excavated material which would be used for backfill. The edge of the pavement cut shall be at least 12 inches beyond the edge of the trench line.

Specifications provided by the City of Raleigh relative to excavation, bedding, and backfilling shall apply with special care taken to ensure that backfill material is of select quality, and is placed and compacted in shallow 6-inch lifts.

After completion of the trenching and pipe laying operations, the backfill shall be brought to the required subgrade depth, from which point, the remaining depth (8" - 12") shall be backfilled with Aggregate Base Course, compacted in two lifts. The base course shall remain for a minimum of four (4) days prior to placement of paving, so as to allow for further natural settlement which may result from normal traffic. When final settlement is obtained, a portion of the ABC shall be removed as required to accommodate the final pavement section. All materials and pavement placement methods shall be in strict accordance with the requirement of the NC DOT - *Standard Specifications for Roads & Structures*, latest edition.

NOTE: Type I 19.0B intermediate course shall be used in lieu of ABC, if required by the NCDOT.

**\*\*\* END OF STANDARD SPECIFICATIONS \*\*\***